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124. stage in the survey, time spent in reconnaissance is certainly not wasted, for once records are started in a compound they must go on or be discarded; there is no time to change later.

Details Collected.

126 A junior officer of the Department was stationed at each centre and generally received the hospitality of the Chief. He was therefore in touch with the centre of local affairs. The number of compounds which can be recorded by one man depends upon many factors, but keeping strict accuracy in mind, rather than the maximum number of records possible, six was found to be a reasonable number for a man previously unacquainted with the work. Each compound was given a serial number, which was entered into a record book together with the place name, the name of the section and the name of the compound owner; these details were entered as a heading. Beneath this the following details were entered :—

Compound.

a. Number of men farming in the compound (including boys big enough to farm).

b. Details of persons supported by the produce from the farm.

c. Livestock owned by the compound.

d. Notes upon the food supply from the previous season.

e. Remarks. (Any details affecting the economics of the household, *i.e.*, trades followed, like smithing; money from sale of livestock; and so on.)

Farms.

f. Total area farmed (entered after survey).

g. Area, and a brief description of each farm.

h. Area of land manured in the current season (after survey).

i. Mean yields of major crops in current season (after harvest).

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Measuring Farms.

The total area of land farmed by each compound was then chain surveyed with the 100′ chain by the usual cadastral methods followed in agricultural survey (well described by Haines in "Surveying for Agricultural Students, Land Agents, and Farmers" (10)). The areas were then computed, and a plan to the scale of 1″=100′, was made of each "farm" (the word "farm" is used for each detached area or field). The farms were given serial numbers for each compound, and the plans were entered into the record book with notes upon situation, soil, and trees. All this is work which can be done during the dry season. 126

Measuring Crop Mixtures.

The next step was to make traced plans from the originals, on a separate sheet of paper for each farm. When dealing with a number of compounds it is essential to write the name of the place, the number of the compound, the owner's name, and the number of the farm, upon each sheet of paper, and to make certain that the staff recognise the same numbering. To avoid confusion the "compound farm" was always "Farm 1", and the others were numbered in order of the distance away from the compound. The traced plans were given to the assistant responsible for the centre concerned, and he entered-in the cropping when planting was finished. Where a number of different crops, or mixtures of crops, were planted in the same farm—as frequently happened, particularly in compound farms—the boundaries of each were marked in on the traced plans with dotted lines. The area of land manured was marked-in by shading. The position of these boundaries was found by running intersection lines from the original survey pillars (marked by stakes in the ground). This work has to be done and checked before the crops have grown so high as to be damaged by chaining.

Computation of Crop Areas.

The areas of each mixture of crops were then calculated. Where a whole farm was planted with a single mixture the area of the farm was the area of the crop, less any land occupied by buildings, etc. In farms which contained a number of mixtures, where only the total area was known, the area of each mixture was found, accurate to the first place of decimals, by graphical methods (10) from the traced plans. Hence the need for scale plans of farms. (To compute the area of a piece of land from a scale plan,

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●/26 proceed as follows: Draw parallel lines 1" (=100') apart in ink upon a piece of tracing cloth, or tracing paper. Place the lined tracing cloth over the plan, the area of which is required, so that one boundary touches a parallel line. With a transparent set-square, lay off "give and take" line at right angles to the lines on the tracing cloth, to equalise the boundaries on the plan. Measure the distances between opposite equalising lines, add, and multiply by 100; this gives the area in square feet. If "give and take" lines are entered lightly in pencil they can be erased and the tracing cloth can be used almost indefinitely.)

Collection of Yield Data.

It was not feasible to weigh all the produce from the farms in order to obtain yield data since crops were harvested irregularly. Neither was it desirable, provided a sufficient number of sample plots could be laid down at random in average parts of the fields. The method adopted was to demarcate at least two square plots of one-fortieth acre (33' x 33') in every acre of the farm; the corners of each plot were marked with stakes and the boundaries with a shallow hoed line. The position of these plots was marked roughly on the cropping plans, and each plot was given a serial number for the farm, in order, radiating out from the compound. By reference to the place, compound number, and plot number any matter relating to single plot could be checked immediately

Cropping Schedules.

Cropping schedules were next prepared for each compound, into which the yields were entered at harvest. The schedules were made on lined foolscap paper and contained as a heading the place name and compound number, and columns from left to right giving—Farm No., Plot No., Cropping, Date of Planting, Date of Harvesting, Yield per Plot, Manuring, Remarks. Considerable importance was attached to the "Remarks" column into which was entered anything to explain why the yield from the particular plot in question should be high or low.

Method of Recording Yields.

Yields were weighed to the nearest quarter of a pound upon a "family" type of spring balance. Cereal crops were recorded as dry head weights, and a sample was set aside to give the threshing percentage. Groundnuts were recorded "dry in shell", and

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sweet potatoes and Coleus potatoes as fresh tubers. Harvesting and weighing had to be left to the junior staff, but visits were paid as often as possible to each centre of record during the harvest season and check weights were taken. It is essential that the staff fully understand what is required of them before the rush of harvest comes on. Any doubtful yields must not be recorded. Nearly half the records in 1932 had to be discarded because a "literate helper" thought it better to put down fictitious yields than to report mistakes. At first some farmers thought we intended to confiscate the produce from the sample plots; but they all readily co-operated with us when disillusioned.

Results of Survey.

Distribution of Recorded Compounds.

The farms of 54 compounds have been surveyed and it is upon the data from these that the following statistics are based. The variation from one compound to another, in almost every detail recorded, makes it necessary to emphasise that, whilst the figures are reasonably accurate in themselves, they are based upon a very small proportion of the population, and the means are reliable as district means, only as our compounds are typical of the centres from which they have been selected. The compounds were distributed at the ten centres of record as follows :—

Zuarungu Area.	Bongo	6
	Nangodi	5
	Sambruno ...	5
	Tongo	5
	Zuarungu ...	8
Navrongo Area.	Chana	6
	Kologo	6
	Navrongo ...	2
	Wiaga	6
Kusasi Area.	Zebilla	5
	Total	54

In discussing the results of the survey work it is proposed to reduce figures in the text to means and percentages as far as possible; details are given in tables in Appendix II.